



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/782,944

02/23/2004

Hideki Tominaga

SUT-0234

7669

74384

7590

01/25/2008

Cheng Law Group, PLLC
1100 17th Street, N.W.
Suite 503
Washington, DC 20036

EXAMINER

GILES, NICHOLAS G

ART UNIT

PAPER NUMBER

2622

MAIL DATE

DELIVERY MODE

01/25/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/782,944

Applicant(s)

TOMINAGA ET AL.

Examiner

Nicholas G. Giles

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 08/05/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims **1-18** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims **1** recites the limitation "said synchronous photography timing controller" in lines 15 and 26. There is insufficient antecedent basis for this limitation in the claim. Line 2 of the claim recites "one synchronous photography timing controller" and line 6 recites "a synchronous photography timing controller". It is unclear how these limitations relate to each other. For examination purposes these limitations will be treated to be the same synchronous photography timing controller.

Regarding claims **2-11**, these claims depend on claim **1** and therefore are rejected.

5. Claim 12 recites the limitation "said synchronous photography timing controller" in lines 16 and 26. There is insufficient antecedent basis for this limitation in the claim. Line 3 of the claim recites "one synchronous photography timing controller" and lines 1 and 7 recite "a synchronous photography timing controller". It is unclear how these limitations relate to each other. For examination purposes these limitations will be treated to be the same synchronous photography timing controller.

Regarding claims 13-18, these claims depend on claim 12 and therefore are rejected.

6. Claim 6 recites the limitation "said photographic sequence control means" in line 7. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 3-5, 7-10, 12, and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riches (U.S. Patent No. 6,157,409) in view of Sasaki et al. (European Patent Application EP 1049333).

Regarding claim 1, Riches discloses:

A photographic apparatus having a plurality of cameras (cameras 1-8 Fig. 5) and one synchronous photography timing controller (shutter

timing, channel sequencer and CCD erasure control 10, 5:36-47, and Fig. 5), each of said cameras having (a) image pickup means for taking in optical images of a photographic subject, carrying out a photoelectric conversion thereof, and outputting the images as electric signals for forming photo images (5:29-35 storing images in digital storage), and (b) a synchronous photography timing controller for controlling the image pickup means to repeat an operation to obtain one photograph in a photographic sequence (shutter timing, channel sequencer and CCD erasure control 10, 5:36-47, and Fig. 5), to reset the photographic sequence once to return to a start state in response to an external reset signal supplied from outside the cameras (4:39-47 and Fig. 5), and to start photography in response to an external trigger signal supplied from outside the cameras (5:38-47 and Fig. 5), wherein said synchronous photography timing controller comprises: reset signal supply means for supplying the external reset signal to each of the cameras (4:39-47 and Fig. 5); and trigger signal supply means for supplying the external trigger signal to each of the cameras (5:38-47 and Fig. 5); whereby synchronous photography is performed with said plurality of cameras according to the external reset signal and the external trigger signal supplied from said synchronous photography timing controller (4:39-47, 5:38-47, and Fig. 5).

Riches is silent with regards to an external clock signal being provided to the cameras for photography. Sasaki et al. discloses a synchronizing master clock for an

entire imaging system in 8:12-17. Sasaki et al. discloses in 8:12-17 that this is advantageous in that the entire system can be synchronized. For this reason it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Riches include an external clock signal being provided to the cameras for photography.

Regarding claim 3, see the rejection of claim 1 and note that Riches further discloses:

Synchronous photography timing controller is arranged to supply the external reset signal in phase without a time lag between the cameras, and to supply the external trigger signal with a phase difference between the cameras, which is a time lag corresponding to a time taken for each of the cameras to obtain a predetermined number of images successively (6:1-12 and 5:38-47, cameras are reset at once and then triggered to record in three subsequent exposure periods).

Note that Sasaki et al. has already been shown to have shown a synchronization master clock, which would supply clock signals in phase, in the rejection of claim 1.

Regarding claim 4, see the rejection of claim 1 and note that Riches further discloses:

Synchronous photography timing controller is arranged to supply at least the external reset signal and the external trigger signal such that each of the external reset signal and the external trigger signal has a phase difference between the cameras, which is a time lag corresponding

to $t \cdot \text{div} \cdot N$ where t is a time taken to pick up one image and N is the number of cameras (5:38-47, 6:1-9, and Fig. 5).

Regarding claim 5, see the rejection of claim 1 and note that Riches is silent with regards to connecting the cameras to the timing controller with equal length cables. Official Notice is taken that it was well known at the time the invention was made to connect components together with equal length cables. An advantage to doing so is that signal delay that occurs on non-equal length cables and causes out of synch operations of the system as a whole can be avoided. For this reason it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Riches include connecting the cameras to the timing controller with equal length cables.

Regarding claim 7, see the rejection of claim 1 and note that Riches further discloses:

Each of the cameras includes an image intensifier having an optoelectronic amplifying function and for adjusting on-off switching, said image pickup means being a solid-state CCD image sensor, said optical images of the photographic subject being projected to said solid-state CCD image sensor after an optical amplification by the optoelectronic amplifying function of said image intensifier (5:15-25 and Fig. 5).

Regarding claim 8, see the rejection of claim 1 and note that Riches further discloses:

Image pickup means is a solid-state CCD image sensor, said optical images of the photographic subject being projected directly to said solid-state CCD image sensor (5:15-25 and Fig. 5).

Regarding claim 9, see the rejection of claim 1 and note that Riches further discloses:

External trigger signal is supplied to the cameras upon lapse of a predetermined time from setting of photographic conditions (5:38-47, timing following receipt of trigger signal of event to be studied).

Regarding claim 10, see the rejection of claim 1 and note that Riches is silent with regards to the trigger signal being provided to the cameras when the timing controller receives an explosion occurrence detection signal. Official Notice is taken that it was well known at the time the invention was made to study explosions that transmit a trigger signal to cameras capable of high speed photography of the explosion. An advantage of this is that a person desiring to view details of an explosion in slow motion can do so. For this reason it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Riches include the trigger signal being provided to the cameras when the timing controller receives an explosion occurrence detection signal.

Regarding claims 12 and 14-17, see the corresponding rejections of claims 1, 3, 4, 9, and 10 that cover these claims.

9. Claims **2 and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Riches in view of Sasaki et al. in further view of Taylor (U.S. Patent No. 5,659,323).

Regarding claim **2**, see the rejection of claim 1 and note that Riches discloses resetting all the cameras at the same time in 6:1-12. Note that Sasaki et al. has already been shown to supply an entire photography system with a master synch clock. Riches and Sasaki et al. are silent with regards to providing the trigger signals all at the same time. Taylor discloses a series of cameras all capturing (exposing) images at the same time in 8:59-9:10. Taylor says in 8:65-9:2 that this is advantageous because the user can combine images from any of the cameras in the array including sequences recorded along a path within the camera array at a fixed point in time. For this reason it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Riches modified by Sasaki et al. include providing the trigger signals all at the same time.

Regarding claim **13**, see the corresponding rejection of claim 2.

10. Claim **6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Riches in view of Sasaki et al. in further view of Ikegami et al. (U.S. Patent No. 3,988,530).

Regarding claim **6**, see the rejection of claim 1 and note that Riches and Sasaki et al. are silent with regards to an internal clock and external clock and being able to switch between the two for providing them to the cameras. Ikegami et al. discloses selecting between an internal clock and an external clock for control of operations of a signal processing circuit in 5:57-63 and Fig. 2. An advantage to this is that a system

can operate on its own or be synchronized with a system that also receives the external clock. For this reason it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Riches modified by Sasaki et al. include an internal clock and external clock and being able to switch between the two for providing them to the cameras.

11. Claims **11 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Riches in view of Sasaki et al. in further view of O'Connolly et al. (U.S. Patent No. 6,463,215).

Regarding claim **11**, see the rejection of claim 4 and note that Riches and Sasaki et al. are silent with regards to the timing controller providing the clock signal having a phase difference between cameras which is a time lag of $t \cdot \text{div} \cdot N$. O'Connolly et al. discloses this in 2:26-33. O'Connolly et al. discloses in 2:50-65 that this is advantageous in that the ratio $t \cdot \text{times} \cdot N$ pictures can be taken per second depending on the number of cameras used and how fast the cameras can take pictures. For this reason it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Riches modified by Sasaki et al. include the timing controller providing the clock signal having a phase difference between cameras which is a time lag of $t \cdot \text{div} \cdot N$.

Regarding claim **18**, see the corresponding rejection of claim 11.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas G. Giles whose telephone number is (571) 272-2824. The examiner can normally be reached on Monday through Friday from 7:30am to 4:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NGG


LIN YE
SUPERVISORY PATENT EXAMINER